

On collective spin excitations in electron doped cuprate high-temperature superconductors

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Abstract

© 2016, Pleiades Publishing, Inc. An analytical formula with three-center terms has been proposed for the calculation of the dynamic spin susceptibility of electron-doped cuprates. The results of the calculation of the imaginary part of the susceptibility reproduce the main features of inelastic neutron scattering and resonant inelastic X-ray scattering. It has been shown that the high-frequency behavior of the dispersion of collective spin excitations is mainly determined by the parameters of the conduction band and hardly depends on the exchange coupling of copper spins. The spin and superconducting gap parameters, as well as correlation effects associated with the three-center terms, play the determining role in the formation of the spin response in the region $Q \approx (\pi, \pi)$.

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